

CLAIMS

1. A gene encoding a protein that has an activity of regulating the pH of vacuoles in plant cells.
- 5 2. A gene encoding a protein that has the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles in plant cells.
- 10 3. A gene encoding a protein that has an amino acid sequence modified by the addition or deletion of one or a plurality of amino acids and/or substitution with other amino acids in the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.
- 15 4. The gene according to claim 1 encoding a protein that has an amino acid sequence having a identity of 20% or more with the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.
- 20 5. The gene according to claim 1 encoding a protein that has an amino acid sequence having a identity of 70% or more with the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.
- 25 6. The gene according to claim 1 that hybridizes to a part or all of a nucleic acid having a nucleotide sequence encoding the amino acid sequence as set forth in SEQ ID NO: 2 under a stringent condition, and that encodes a protein having an activity of regulating the pH of vacuoles.

A2 7. (Amended) A vector comprising the gene according to claim 1.

8. A host cell transformed with the vector according to claim 7.

A3 9. (Amended) A protein encoded by the gene according to claim 1.

10. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method

comprising culturing or growing the host cell according to claim 8 and then harvesting said protein from said host cell.

11. (Amended) A plant in which the gene according to claim 1 has been introduced or a progeny thereof having the same property as said plant, or a tissue thereof.

12. (Amended) A cut flower of the plant according to claim 11 or a progeny thereof having the same property as said plant.

13. (Amended) A method of regulating the pH of vacuoles comprising introducing the gene according to claim 1 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

14. (Amended) A method of controlling the flower color of a plant comprising, introducing the gene according to claim 1 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

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Please add new claims 15-51 as follows:

15. A vector comprising the gene according to claim 2.

16. A vector comprising the gene according to claim 3.

17. A vector comprising the gene according to claim 5.

18. A vector comprising the gene according to claim 6.

19. A host cell transformed with the vector according to claim 15.

20. A host cell transformed with the vector according to claim 16.

21. A host cell transformed with the vector according to claim 17.

22. A host cell transformed with the vector according to claim 18.

23. A protein encoded by the gene according to claim 2.

24. A protein encoded by the gene according to claim 3.

25. A protein encoded by the gene according to claim 5.

26. A protein encoded by the gene according to claim 6.

27. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method comprising culturing or growing the host cell according to claim 19 and then harvesting said protein from said host cell.

28. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method comprising culturing or growing the host cell according to claim 20 and then harvesting said protein from said host cell.

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29. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method comprising culturing or growing the host cell according to claim 21 and then harvesting said protein from said host cell.

30. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method comprising culturing or growing the host cell according to claim 22 and then harvesting said protein from said host cell.

31. A plant in which the gene according to claim 2 has been introduced or a progeny thereof having the same property as said plant, or a tissue thereof.

32. A plant in which the gene according to claim 3 has been introduced or a progeny thereof having the same property as said plant, or a tissue thereof.

33. A plant in which the gene according to claim 5 has been introduced or a progeny thereof having the same property as said plant, or a tissue thereof.

34. A plant in which the gene according to claim 6 has been introduced or a progeny thereof having the same property as said plant, or a tissue thereof.

35. A cut flower of the plant according to claim 31 or a progeny thereof having the same property as said plant.

36. A cut flower of the plant according to claim 32 or a progeny thereof having the same property as said plant.

37. A cut flower of the plant according to claim 33 or a progeny thereof having the same property as said plant.

38. A cut flower of the plant according to claim 34 or a progeny thereof having the same property as said plant.

39. A method of regulating the pH of vacuoles comprising introducing the gene according to claim 2 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

40. A method of regulating the pH of vacuoles comprising introducing the gene according to claim 3 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

41. A method of regulating the pH of vacuoles comprising introducing the gene according to claim 5 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

42. A method of regulating the pH of vacuoles comprising introducing the gene according to claim 6 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

43. A method of controlling the flower color of a plant comprising introducing the gene according to claim 2 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

44. A method of controlling the flower color of a plant comprising introducing the gene according to claim 3 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

45. A method of controlling the flower color of a plant comprising introducing the gene according to claim 5 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

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46. A method of controlling the flower color of a plant comprising introducing the gene according to claim 6 into a plant or plant cells and then allowing said gene to be expressed in said plant or plant cells.

~~47. A method of controlling the flower color of a plant comprising suppressing expression of the gene according to claim 1 in a plant or plant cells.~~

~~48. A method of controlling the flower color of a plant comprising suppressing expression of the gene according to claim 2 in a plant or plant cells.~~

~~49. A method of controlling the flower color of a plant comprising suppressing expression of the gene according to claim 3 in a plant or plant cells.~~

~~50. A method of controlling the flower color of a plant comprising suppressing expression of the gene according to claim 5 in a plant or plant cells.~~

~~51. A method of controlling the flower color of a plant comprising suppressing expression of the gene according to claim 6 in a plant or plant cells.--~~